

A novel organic solvent tolerant lipase from *Bacillus sphaericus* 205y: extracellular expression of a novel OST-lipase gene

ABSTRACT

An organic solvent tolerant (OST) lipase gene from *Bacillus sphaericus* 205y was successfully expressed extracellularly. The expressed lipase was purified using two steps purification; ultrafiltration and hydrophobic interaction chromatography (HIC) to 8-fold purity and 32% recovery. The purified 205y lipase revealed homogeneity on denaturing gel electrophoresis and the molecular mass was at approximately 30 kDa. The optimum pH for the purified 205y lipase was 7.0-8.0 and its stability showed a broad range of pH value between pH 5.0 to 13.0 at 37 °C. The purified 205y lipase exhibited an optimum temperature of 55 °C. The activity of the purified lipase was stimulated in the presence of Ca²⁺ and Mg²⁺. Ethylenediaminetetraacetic acid (EDTA) has no effect on its activity; however inhibition was observed with phenylmethane sulfonyl fluoride (PMSF) a serine hydrolase inhibitor. Organic solvents such as dimethylsulfoxide (DMSO), methanol, p-xylene and n-decane enhanced the activity. Studies on the effect of oil showed that the lipase was most active in the presence of tricaprin (C10). The lipase exhibited 1,3 positional specificity.

Keyword: Bacteriocin release protein; Organic solvent tolerant lipase; *Bacillus sphaericus* 205y; Purification; Characterization